

CANCER INCIDENCE

CANCER INCIDENCE BY PRIMARY SITE

This section contains a report on Montana's cancer incidence data for the diagnosis years 1998-2007, reported as of October 2008 to the Montana Central Tumor Registry. Mortality data in this report are shown for only the 2007 calendar year. Overall, reporting is over 95% complete for cancer cases diagnosed 1998-2007. Reporting for the 2007 diagnosis year is approximately 84% complete with 4,531 new cancer diagnoses having been reported. The expected number of Montana cancer cases for 2007 is approximately 5,000. Estimates of Montana's expected cancer cases are based on the North American Association of Central Cancer Registries (NAACCR) method. The expected incidence rate for Montana was computed from Montana race-sex-site-specific age-adjusted death rates (2000 U.S.) and incidence-to-mortality (I/M) rate ratios computed from Statistics, Epidemiology, and End Results (SEER) race-sex-site-specific age-adjusted (2000 U.S.) incidence rates and U.S. race-sex-site-specific age-adjusted death rates (2000 U.S.).

Table C-1 shows reported incidence of cancer for Montana residents diagnosed from 1998-2007 (10-year incidence). While previous reports showed cancer incidence data for one year, this report tabulates cancer incidence for 10 years and the data should not be compared with those in previous publications showing one-year incidence data. The table shows cancer incidence by sex and by primary site--the original bodily location or organ system of the cancer. The most frequently diagnosed cancers were of the prostate (17.0% of all cancer diagnoses, 33% of male diagnoses), female breast (16.7% of all diagnoses, 35% of female diagnoses), the lung and bronchus (13.9%), the colon (7.2%), melanoma (3.3%), the urinary bladder (4.7%), Hodgkin and Non-Hodgkin Lymphoma (4.3%), and the rectum and rectosigmoid (2.8%). Invasive cervical cancer accounted for only 1.5% of female cancers (9.2% for both in-situ and malignant) for females for 1998-2007. However, 1,803 of the 2,144 cervical cancers were in-situ--that is, non-invasive. Testicular cancer also accounted for 1.1% of male cancers--only 266 cases were reported in 1998-2007.

Table C-2 shows the incidence of cancer for the ten most frequently diagnosed primary sites and by the sex and age of the patient at diagnosis. Men diagnosed with prostate cancer tended to be 50 or older. Diagnoses of breast cancer in women generally began in their late thirties and the age distribution was not as concentrated on a central age category as was that of prostate cancer for men. In 1998-2007, Montanans diagnosed with cancers of the lung and bronchus or the urinary bladder were most likely to be men aged 50 or older. Those diagnosed with cancer of the colon were about equally likely to be male or female and usually 50 years of age or older. The distribution of cancer diagnoses by site, sex and age is shown in **Table C-2**. Cancer diagnoses by site, sex, and county of residence is shown in **Table C-3** for the 10 most frequently diagnosed primary sites.

Figures 49, 51, 53, and 55 show the number of cancer diagnoses by year, sex of the patient, and stage of disease at diagnosis for prostate, breast, lung, and colorectal cancer, respectively. The stage of disease is recorded at the time of diagnosis and is not changed if the cancer progresses. Diagnosis at a localized stage means that the cancer has not spread beyond the organ or site of origin. Diagnosis at a regional stage means the cancer has spread to adjacent organs or regional lymph nodes. Diagnosis at a distant stage means the cancer has spread past adjacent organs or tissues to lymph nodes or organs elsewhere in the body.

Figures 50, 52, 53, and 56 show the five-year relative survival rates for these same cancers, comparing Montana and the United States (SEER). SEER rates are used for comparison as they represent the U.S. as a whole and also provide survival statistics. The five-year survival rate is the percent of all patients who are living five years after diagnosis, whether the patient is in remission, disease-free, or under treatment. These rates have been adjusted to account for patients dying from causes other than cancer.

PROSTATE CANCER

Prostate cancer was the most common cancer diagnosed in men in Montana and the United States, with 8,276 cases reported for 1998-2007 and 773 cases reported for 2007 in Montana. This incidence rate usually exceeds that of lung cancer. Nationally, it is primarily a disease of the elderly, as the median age at diagnosis is 70. In 2007, 115 Montana residents died of prostate cancer (**Tables D-1, D-2, D-5, and D-6**), making it the fourth leading cause of cancer deaths.

Figure 49 shows the number of prostate cancer diagnoses reported by year and the stage at diagnosis for the years 1998 through 2007. The patient diagnosed with prostate cancer at early stages may be asymptomatic or just have symptoms of lower urinary tract obstruction. During 1998-2007, 75% of prostate cancers were diagnosed at a local stage but being diagnosed at a localized stage has increased from 65% in 1998 to 84% in 2007. Bone pain is the most frequent complaint from patients diagnosed with advanced disease. In Montana, the percentage of prostate cancers diagnosed at a distant stage decreased from 5% in 1998 to 3% in 2007. The Prostate-Specific Antigen (PSA) test has been useful in detecting prostate cancer at earlier stages. Almost 95% of cancers of the prostate are characterized as adenocarcinoma. The percent of unknown stage at diagnosis decreased from 17% in 1998 to 3% in 2007.

Figure 49

DIAGNOSIS OF PROSTATE CANCER MONTANA RESIDENTS, 1998-2007[^]

Year of Diagnosis	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of Cases Diagnosed	744	782	812	854	923	887	875	859	767	773
Percent Stage at Diagnosis*										
Local	65%	63%	68%	71%	75%	72%	83%	81%	85%	84%
Regional	13%	15%	12%	10%	11%	13%	11%	11%	10%	9%
Distant	5%	3%	4%	4%	3%	4%	4%	4%	3%	3%
Unknown	17%	18%	15%	15%	11%	11%	2%	3%	2%	3%

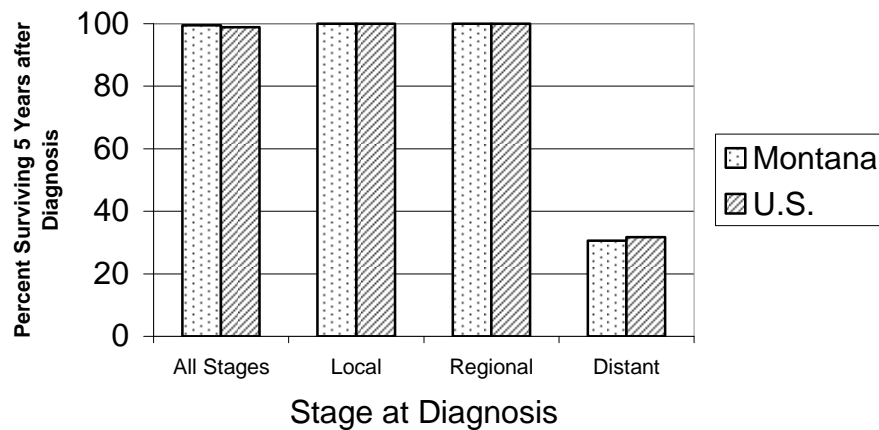
[^] 2006 data only 80% complete.

* Percentages may not add to 100 because of rounding.

Figure 50 shows five-year survival rates for prostate cancer, comparing Montana's to the United States' rate. One hundred percent of Montanans diagnosed at a localized or regional stage were alive five years after diagnosis; however, only about 30% of those diagnosed at a distant stage were alive five years after diagnosis. Although survival rates are high for early diagnosis, it should be re-emphasized that prostate cancer was the fourth leading cause of cancer deaths among Montanans in 2007.

Figure 50

**FIVE-YEAR RELATIVE SURVIVAL BY STAGE FOR PROSTATE CANCER
MONTANA AND THE UNITED STATES, 1998-2007**



Prostate cancer is generally treated with surgery or radiation. About 45% of patients diagnosed with prostate cancer have surgery (transurethral resection of the prostate (TURP) or prostatectomy) and about 30% of patients diagnosed with prostate cancer have radiation therapy during first course of treatment. Very few patients opt for both surgery and radiation. Patients with early stage prostate cancer often opt for no treatment, but their physicians must watch these patients closely. About 20% are treated with hormonal therapy shortly after diagnosis, but this course of treatment is usually reserved for patients with advanced disease.

BREAST CANCER

Breast cancer was the most frequently reported malignancy among Montana women with 8,101 cases reported for 1998-2007 and 772 cases reported for 2007. It was the underlying cause of death for 116 female Montanans and no males, making breast cancer the third leading cause of cancer deaths in 2007 (**Tables D-1, D-2, D-5, and D-6**). Breast cancer incidence increases dramatically with age, and the majority of cases occur after age 50. In Montana in 2007, 21% were diagnosed at an in-situ stage, 50% of breast cancers at a local stage, 24% at a regional stage, and 4% at a distant stage.

The distribution of stage at diagnosis is shown in **Figure 51**. The proportion of patients diagnosed at an in-situ stage has increased slightly over the past decade, while the proportion diagnosed at local and regional stages has decreased. Patients are being diagnosed at earlier stages and are detecting cancers earlier. It is well established that women with early-stage breast cancer have better chances of survival. Screening mammography can detect a breast cancer in an earlier stage, which may account for an increase in the diagnosis of breast cancer nationally over the last decade. The percent of unknown stage at diagnosis decreased from 4% in 1998 to 2% in 2007.

Figure 51

**DIAGNOSIS OF BREAST CANCER
MONTANA RESIDENTS, 1998-2007[^]**

Year of Diagnosis		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of Cases Diagnosed	Males	5	5	2	5	2	3	3	5	3	6
	Females	779	837	834	866	785	844	784	819	781	772
Percent Stage at Diagnosis*											
In-Situ		14%	17%	17%	20%	19%	20%	22%	18%	18%	21%
Local		53%	52%	54%	49%	52%	50%	48%	50%	50%	50%
Regional		27%	23%	22%	24%	22%	25%	23%	26%	26%	24%
Distant		2%	4%	3%	3%	2%	3%	4%	4%	3%	4%
Unknown		4%	5%	4%	4%	4%	3%	3%	2%	2%	2%

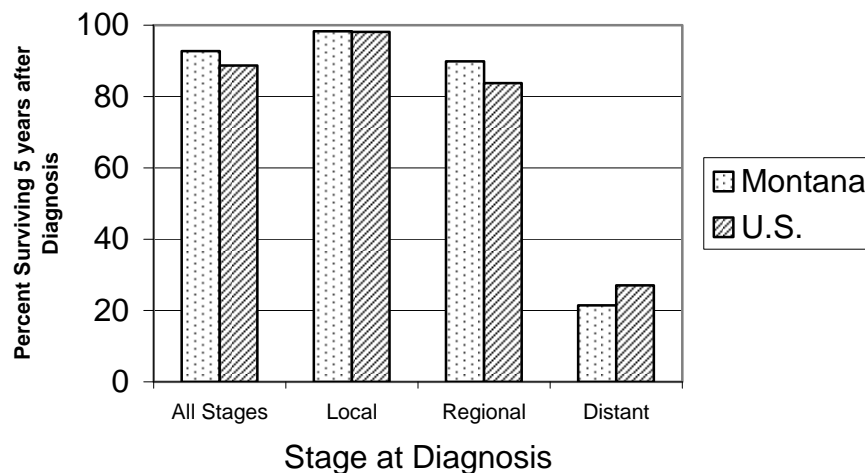
[^] 2006 data only 80% complete.

* Percentages may not add to 100 because of rounding.

Figure 52 shows the five-year relative survival rate for women diagnosed with breast cancer, comparing Montana with the United States. For Montana women, 98% of women survived five years if diagnosed at a local stage and about 88% if diagnosed at a regional stage. If the cancer was diagnosed at a distant stage, the five-year rate of survival was 20%. Breast cancer is treated in a variety of ways. About 95% of breast cancer patients are treated with surgery (lumpectomy or mastectomy) and about 40% are treated with radiation. About 40% are treated with both surgery and radiation and 35% of patients are treated with chemotherapy, hormonal therapy or both. Almost 75% of breast cancers are duct cell carcinomas and over 15% are lobular carcinomas, which are a form of adenocarcinoma of the mammary gland.

Figure 52

**FIVE-YEAR RELATIVE SURVIVAL BY STAGE FOR BREAST CANCER
MONTANA AND THE UNITED STATES, 1998-2007**



LUNG CANCER

In Montana, lung cancer was the second most common cancer diagnosis among men (after prostate cancer) and women (after breast cancer). In the years 1998-2007, 6,735 lung cancer cases have been reported and in 2007, 669 cases have been reported. It was the underlying cause of death for 562 Montanans (**Tables D-1, D-2, D-5, and D-6**), making it the leading cause of cancer deaths.

The number of cases diagnosed and the stage at diagnosis for lung cancer are shown in **Figure 53**. In 2007, 48% of lung cancers were diagnosed at a distant stage and only 14% at a local stage. Certain types of lung cancer spread very early and quickly, which causes the patient to be diagnosed at a regional or distant stage. The stage was unknown or unstageable for about 14% of lung cancer cases in 2007.

Figure 53

DIAGNOSIS OF LUNG CANCER MONTANA RESIDENTS, 1998-2007[^]

Year of Diagnosis		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of Cases Diagnosed	Males	411	339	380	357	367	371	344	373	323	340
	Females	319	263	308	331	299	299	301	355	326	329
Percent Stage at Diagnosis*											
Local		17%	16%	22%	15%	15%	15%	15%	16%	16%	14%
Regional		27%	28%	26%	29%	26%	24%	25%	21%	24%	23%
Distant		39%	39%	38%	37%	43%	47%	47%	55%	49%	48%
Unknown		17%	17%	14%	19%	16%	15%	12%	9%	11%	14%

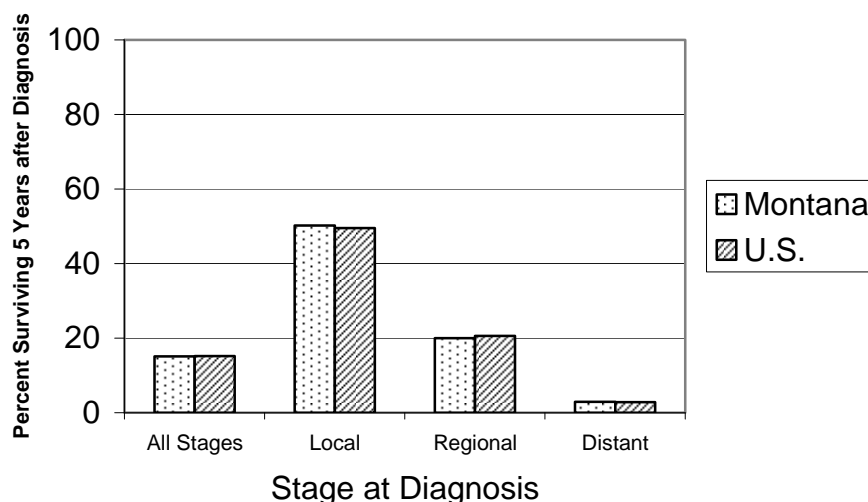
[^] 2006 data only 80% complete.

* Percentages may not add to 100 because of rounding.

Lung cancer has a much poorer prognosis than other cancers, partly because relatively few cases are diagnosed at an early stage. **Figure 54** shows the five-year relative survival rate for lung cancer, comparing Montana and the United States rates. Fifty percent of patients diagnosed at a localized stage survive five years; however, only 19% survive five years if diagnosed at a regional stage and about 3% if diagnosed at a distant stage. The types of treatment performed for lung cancer are determined by the type of cancer and the stage at diagnosis. Most lung cancers are treated with surgery, radiation, or chemotherapy. About 21% of patients with lung cancer are treated with surgery and about 35% are treated with radiation. Chemotherapy is given to about 45% of patients. A cough is the most common symptom of a lung cancer, but since coughing is a common symptom of many acute and chronic conditions, the diagnosis of lung cancer may be delayed. About 26% of lung cancers are adenocarcinoma, 24% are small cell carcinoma, and 20% are squamous cell carcinomas, derived from stratified squamous epithelium.

Figure 54

**FIVE-YEAR RELATIVE SURVIVAL BY STAGE FOR LUNG CANCER
MONTANA AND THE UNITED STATES, 1998-2007**



COLORECTAL CANCER

Colorectal cancer was the third most common malignancy in Montanans with 4,885 cases reported for 1998-2007; there were 423 cases diagnosed and 161 deaths caused by colorectal cancer in 2007 (**Tables D-1, D-2, D-5, and D-6**), making it the second leading cause of cancer deaths. Because of the anatomic proximity and physiologic similarity of the colon and rectum, these two segments are often reported together as “colorectal” cancer. The incidence of colorectal cancer is extremely low in childhood and increases with age. **Figure 55** shows the frequency and stage at diagnosis for cancers of the colorectum. In 2007, 40% were diagnosed at a local stage, 38% at a regional stage, and 16% at a distant stage.

Figure 55

**DIAGNOSIS OF COLORECTAL CANCER
MONTANA RESIDENTS, 1998-2007[^]**

Year of Diagnosis		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of Cases Diagnosed	Males	289	283	251	297	264	230	241	255	251	206
	Females	235	239	246	241	241	250	223	210	216	217
Percent Stage at Diagnosis*											
Local		34%	33%	37%	36%	36%	41%	35%	40%	43%	40%
Regional		41%	43%	42%	45%	39%	38%	37%	32%	31%	38%
Distant		17%	14%	15%	12%	17%	18%	18%	20%	20%	16%
Unknown		8%	9%	6%	7%	8%	4%	10%	8%	6%	6%

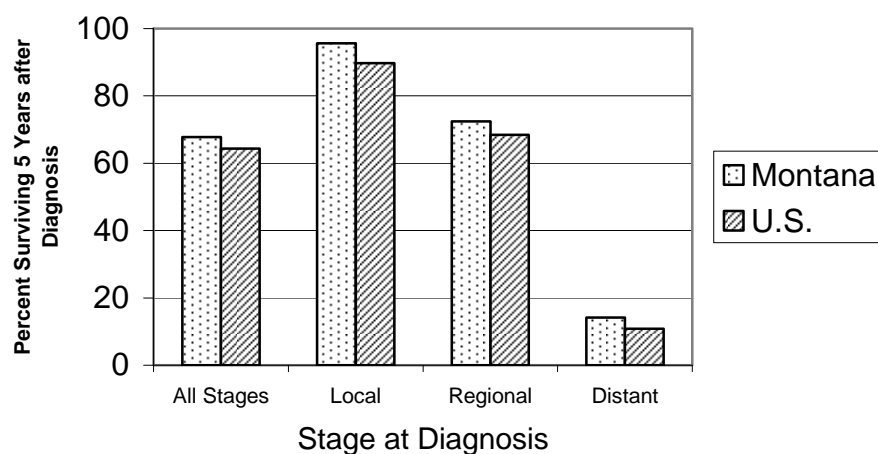
[^] 2006 data only 80% complete.

* Percentages may not add to 100 because of rounding.

Figure 56 shows the five-year relative survival of patients diagnosed with colorectal cancer, comparing Montana and the United States. When colorectal cancer is detected at an early, or localized, stage the five-year relative survival is 95%. After the cancer has spread to a regional organ or lymph node, the survival rate drops to about 72%. Colorectal cancer is most often treated with surgery or chemotherapy or both. About 85% of patients with colorectal cancer are treated with surgery and about 35% are treated with chemotherapy. About 35% of patients with rectal cancer are treated with radiation but only about 1% of patients with colon cancer are treated with radiation. About 92% of colorectal cancers are adenocarcinoma and of those, 12% are mucinous (an adenocarcinoma which secretes mucin).

Figure 56

**FIVE-YEAR RELATIVE SURVIVAL BY STAGE FOR COLORECTAL CANCER
MONTANA AND THE UNITED STATES, 1998-2007**



For more information on the incidence of cancer in Montana, visit the web site of the Montana Central Tumor Registry at <http://www.dphhs.mt.gov/PHSD/cancer-control/tumor-registry-index.shtml>.

References:

- Ries LAG, Melbert D, Krapcho M, Mariotto A, Miller BA, Feuer EJ, Clegg L, Horner MJ, Howlader N, Eisner MP, Reichman M, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2005, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2005/, based on November 2007 SEER data submission, posted to the SEER web site, 2008.
- North American Association of Central Cancer Registries, Cancer in North America: 1996-2000, Volume One: Incidence, 2003.
- Robert B. Cameron, MD, Practical Oncology a Lange Clinical Manual, 1994.
- Clinical Oncology, Second Edition, American Cancer Society, 1995.